

Appln No. 10/665,304
Amdt date June 6, 2006
Reply to Office action of March 6, 2006

REMARKS/ARGUMENTS

The above amendments and these remarks are responsive to the Office Action mailed on March 6, 2006. Claims 1, 2, 3, 5-11, 25 and 32 have been amended for clarity. Claims 34-49 have been added and are directed to subject matter disclosed in the application as originally filed. No new matter has been added. Claims 4 and 13-24 have been canceled. Claims 1-3, 5-12, and 25-49 are now pending in this application. Reconsideration on the basis of the above amendments and remarks below is kindly requested.

The Examiner rejected claims 3 and 4 under 35 USC §112. Claim 3 has been amended to overcome this objection. Claim 4 has been canceled.

The Examiner rejected claims 1, 7-14 and 17-24 under 35 USC §102(b) as being anticipated by or, in the alternative, under 35 USC §103(a) as being obvious over Komanduri, U.S. Patent No. 4,797,138. The Examiner also rejected claims 1-6, 8-16 and 18-33 under 35 USC §102(b) as being anticipated by, or in the alternative under 35 USC §103(a), as being obvious over Aronsson, et al., U.S. Patent No. 4,764,434. The Examiner rejected claims 1-6, 8-11, 13-16, 18-30, 32 and 33 under 35 USC §102(b) as being anticipated by or, in the alternative, under 35 USC §103(a) as being obvious over Burnand, et al., U.S. Patent No. 4,802,895. The Examiner rejected claims 1-6, 8-11, 13-16, 18-30, 32 and 33 under 35 USC §102(b) as being anticipated by or, in the alternative, under 35 USC §103(a) as being obvious over Hall, et al., U.S. Patent No. 4,604,106. The Examiner also rejected claims 1, 7, 13, 14, 17, 23 and 24 under 35 USC §103(a) as being unpatentable over Vale, et al., U.S. Patent No. 6,779,951 in view of Bovenkerk, et al., U.S. Patent No. 4,311,490.

Appln No. 10/665,304

Amdt date June 6, 2006

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Claim 1 is directed to a method manufacturing or cutting element which includes "selecting a substrate at least a portion of which has a density of less than 100% of full density . . .; and sintering the resulting assembly of substrate and ultra hard material at a sufficient temperature and pressure for full densification and metallurgical joining of the substrate and ultra hard material, wherein the ultra hard material shrinks during sintering, and wherein the density is selected for reducing a constraint provided by the substrate on the ultra hard material shrinkage during sintering. Claim 25 is directed to a method of manufacturing cutting element comprising "selecting a substrate having a first portion that has a density less than 100% of full density, and a second portion that has a density that is different from the first density; . . . and processing the resulting assembly of substrate and ultra hard materials at sufficient temperature and pressure for full densification and metallurgical joining of the substrate and ultra-hard material, wherein the ultra hard material shrinks during sintering and wherein the densities of the two portions are chosen to reduce a constraint to the ultra hard material shrinkage provided by the substrate during sintering." Claim 40 is directed to a method for controlling sintering-induced stresses generated on an ultra hard material layer formed over a substrate comprising "determining shrinkage of the ultra hard material during sintering; selecting a substrate having a portion having a density selected for causing said portion to have a shrinkage similar to the determined shrinkage of the ultra hard material; placing the ultra hard material over the substrate; and sintering the ultra hard material and substrate forming the ultra hard material layer." Neither Komanduri, nor Aronsson, et al., nor Bernard, et al., nor Hall, et al., nor Vale, et al., nor Bovenkerk, et al. appear to disclose, teach or suggest selecting a density of at least a portion of a

Appln No. 10/665,304
Amdt date June 6, 2006
Reply to Office action of March 6, 2006

substrate for the purpose of "reducing a constraint provided by the substrate to the ultra hard material shrinkage during sintering" as required by claim 1; nor do they appear to disclose selecting a substrate having two portions wherein "the densities of the two portions are chosen to reduce a constraint to the ultra hard material shrinkage provided by the substrate during sintering" as required by claim 25; nor do they appear to disclose determining shrinkage of the ultra hard material during sintering and selecting a substrate having a portion having a density for causing said portion to have a shrinkage similar to the determined shrinkage of the ultra hard material, as required by claim 40. In fact, these references do not appear to disclose, teach or suggest the reduction of the shrinkage constraint provided by a substrate to the ultra hard material during sintering as required by claims 1 and 25, nor do they appear to disclose, teach or suggest the determination of shrinkage of the ultra hard material or the selection of a substrate that has a portion that has a shrinkage similar to that of the ultra hard material. As such, neither of these references anticipates claims 1, 25 or 40 and neither of these references alone or in combination render claims 1, 25 and 40 obvious.

Claims 2, 3, 4-12 are directly or indirectly dependent from claim 1. Claims 26-33 are directly or indirectly dependent from claim 25. Claims 34-36 are dependent from claim 1. Claims 37-39 are dependent from claim 25. Claims 41-49 are directly or indirectly dependent from claim 40. Claims 1, 25 and 40 are now believed to be in condition for allowance over Komanduri, Aronsson, et al., Bernard, et al., Hall, et al., Vale, et al., and Bovenkirk, et al. As such, claims 2, 3, 5-12, 25-39 and 41-49 are also allowable over these references for the same reasons as the claims from which they depend from and for the additional limitations they

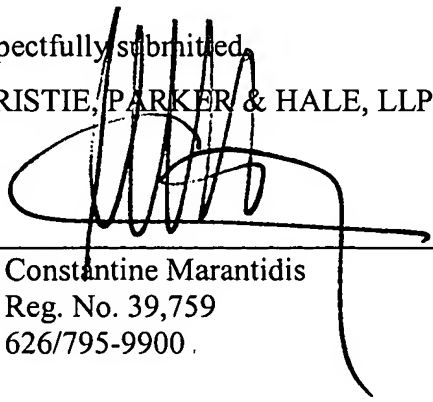
Appln No. 10/665,304
Amdt date June 6, 2006
Reply to Office action of March 6, 2006

contain therein. For example, claim 34 is dependent from claim 1 and further requires that the density of the substrate is selected to minimize the constraint provided by the substrate to the ultra hard material shrinkage during sintering. Neither of these cited references appears to disclose the selection of the density of a substrate for the purpose of minimizing the constraint the substrate provides on the ultra hard material shrinkage during sintering.

The rejections and objections to all claims pending in this application are believed to have been overcome and this application is now believed to be in condition for allowance. Should the Examiner have any remaining questions or concerns about the allowability of this application, the Examiner is kindly requested to call the undersigned attorney to discuss them.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By


Constantine Marantidis
Reg. No. 39,759
626/795-9900

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